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RISK ASSESSMENT FOR POSTTRAUMATIC STRESS DISORDER IN A COHORT OF U.S. NAVY PERSONNEL

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Human subjects participated in this study after giving their free and informed consent. This research has been conducted in compliance with all applicable Federal Regulations governing the Protection of Human Subjects in Research.

SUMMARY

Problem. The number of personnel entering the U.S. Navy with self-reported symptoms of posttraumatic stress disorder (PTSD) is unknown. Additionally the relationship between pre- and post-military trauma and PTSD symptoms is poorly understood. Most studies of PTSD among military personnel have been retrospective, and they have focused on unique subgroups, such as combat veterans, that are not representative of the military population as a whole. Using retrospective designs, it is not possible to verify what factors actually precede and predict symptoms of PTSD.

Objective. This research examined vulnerability to PTSD during Navy service in relation to prior histories of trauma and stress. Using a prospective design this study: (1) assessed rates of PTSD symptomology among U.S. Navy recruits at the time they reported for basic training and documented the percentages of personnel whose symptoms met criteria for PTSD over their first 2 years of service; (2) evaluated whether participants with histories of premilitary trauma had significantly greater PTSD symptomology than did those without such histories; (3) assessed the relationship of PTSD symptomology with adjustment and job performance during military service; and (4) explored whether experiences of premilitary victimization moderated the relationship between postmilitary trauma and subsequent PTSD symptomology.

Approach. During their first week of training, male and female U.S. Navy recruits were asked about their premilitary experiences of childhood sexual abuse, physical abuse, intimate partner violence, and life-threatening adult trauma such as car accidents and violent assault. They were also assessed for symptoms of PTSD using the Los Angeles Symptom Checklist (LASC). Subsequently they were followed over a 2-year period to assess continuing symptoms of PTSD and to document recent military work stress, job satisfaction, experiences of victimization and trauma, and military job performance.

Results. The results of this report are presented in 4 sections to address the primary focuses of this study. The first section explores PTSD symptomology among participants (a) on entry into basic training and (b) longitudinally over 2 years of service. At baseline (see page 16):

- 15% of all participants reported symptoms that met the LASC classification for PTSD; 18% were classified with partial PTSD.
- In comparison with men, 6% more women were classified with partial PTSD and 5% more women were classified with full PTSD.
- 6% to 20% of the participants had scores in the clinical range on the Trauma Symptom Inventory Subscales. The lowest percentages were for Anxious Arousal (6%), Depression (8%), and Sexual Concerns (8%). The highest percentage was for Dysfunctional Sexual Behavior.

Longitudinally over the first two years of service (see page 18):

- There were significant gender differences in PTSD classification at each follow-up. However, at 12 and 24 months there were only significant differences in the percentages with partial, not full PTSD.
- PTSD symptoms increased significantly among participants who remained in the study between baseline and 6 months and between 1 year and 2 years. There were no significant differences from 6-months to 1-year.

The second section of this report focuses on the relationship of premilitary trauma with PTSD symptomology. The results include information regarding (a) the importance of specific types of trauma for PTSD symptomology, (b) the importance of multiple traumas for PTSD, and (c) the longitudinal relationship of premilitary trauma with PTSD over 2 years of service. Results regarding type of trauma and PTSD symptoms included the following (see page 21):

- In bivariate analyses, there were significant relationships between PTSD and 19 out of 20 types of pre-military trauma considered.
- In multivariate analysis interpersonal and criminal traumas were most associated with PTSD. Specifically adult sexual assault, intimate partner violence, and parental verbal aggression in childhood were consistently predictive of PTSD.
- Sexual trauma has been particularly important in the development of PTSD for women in past research (Fontana & Rosenheck, 1998; Wolfe et al., 1998). However, we found no significant differences in the strength of the relationships of sexual versus other types of trauma with PTSD for men or women.

In evaluating multiple trauma and PTSD, we found that (see page 24):

- Among participants reporting any type of interpersonal trauma, 60% reported multiple types of experiences.
- Only 8% to 9% of those who had not experienced any interpersonal trauma were categorized with PTSD, while 44% of men and 48% of women were identified with PTSD among those who reported 5 or more types of interpersonal trauma.
- Average PTSD symptom scores and symptom score standard deviations were correlated. Symptomology was lowest and PTSD outcomes were most homogenous among participants who had not experienced any interpersonal trauma. Symptomology was highest and variability in PTSD outcomes was greatest among those reporting 5 or more types of interpersonal trauma.

Results regarding premilitary trauma and PTSD showed that (see page 25):

- There were significant relationships between total premilitary interpersonal trauma and PTSD symptom scores at every followup.

- Relationships between premilitary trauma and PTSD at followup were most likely mediated by baseline symptomology, because they were no longer significant after controlling baseline scores.

The third section focuses on the relationship of PTSD symptomology with participants' personal adjustment and job performance during their first 2 years of service. In this section we examined the relationship of PTSD with (a) military employment satisfaction, (b) physical symptoms and healthcare use, (c) disciplinary action, and (d) attrition from service. Looking at satisfaction with employment and healthcare use, we found that (see pages 27 and 28):

- Overall, military job satisfaction declined slightly over the first 2 years of service.
- PTSD symptoms were significantly correlated with satisfaction with military service. Participants reporting more symptoms of PTSD tended to have lower satisfaction.
- PTSD symptomology at baseline was prospectively correlated with physical health and healthcare use across 2 years of service.

Data regarding demotion and disciplinary action suggested that (see page 30):

- PTSD symptom scores were significantly higher at baseline, 6 months, and 1 year ($p < .05$) among women who received a demotion during their first 2 years of service.
- Those who were categorized as PTSD positive at baseline were 1.62 times more likely to report either having being put on report or having received a UCMJ punishment at final follow-up (19%) than were participants classified as PTSD negative (13%), $p < .05$.

Data regarding attrition from Navy service suggested that (see page 32):

- 24% of the participants attrited from the Navy prior to the end of their first 2 years of service.

- Baseline PTSD symptoms were related to higher attrition rates. The highest attrition occurred among participants with total PTSD symptom scores over 40 (women, *n* = 99, men, *n* = 65), half of whom attrited.
- There were no differences among attrites in the likelihood of an honorable, general, uncharacterized, or other than honorable discharge comparing those who were versus were not classified with PTSD at baseline.
- Female attrites who were PTSD positive at baseline were more often discharged for personality disorders and less often for family hardship or drug/alcohol use. There was no systematic relationship between type of discharge and PTSD for male attrites.

The final focus of this study was to explore moderating factors on the relationship between PTSD symptomology and trauma experienced during military service. Our analyses provided support for the hypothesis that premilitary stress and victimization moderate the relationship between trauma and PTSD during Navy service (see page 35):

- Partial correlations (controlling baseline PTSD) between PTSD at 2-year followup and total interpersonal trauma during the prior year were significantly stronger for participants reporting multiple premilitary interpersonal trauma than they were for those reporting none or only one type of premilitary interpersonal trauma.
- In logistic analysis, baseline TSI dissociation scores, as well as 2-year followup reports of interpersonal trauma, social support, and military job satisfaction were significantly related to the likelihood of final PTSD classification. Additionally, the interaction between childhood family stability and trauma at followup was significant.
- The risk of being classified with PTSD given the experience of multiple trauma tended to decrease as childhood family stability increased.

Conclusions. This is the first longitudinal study to explore symptoms of PTSD among a representative group of Navy recruits. Results suggest that premilitary symptoms of PTSD are related to subsequent military performance and individual health. Furthermore, this report provides evidence for the hypothesis that cumulative life-histories of stress and trauma influence the likelihood that a person will develop PTSD in reaction to a significant trauma. Specifically, we found that correlations between trauma and PTSD were stronger for persons with a past history of family instability and interpersonal trauma. This report concludes with the implications of these findings for current models of PTSD symptomology within military populations and with suggestions for future research.

ABSTRACT

Research suggests that individuals with histories of trauma and abuse are more likely to develop posttraumatic stress disorder (PTSD) in reaction to subsequent stress. However, most studies in this area have used retrospective survey designs. This study analyzed data from a longitudinal study of Navy recruits, with data available on participants' premilitary histories of trauma, abuse, and PTSD symptomology. It estimated base rates for the prevalence and incidence of PTSD among Navy personnel. This study further explored the relationship of PTSD symptomology to military job performance, and assessed moderating effects on the relationship between stressful events during military service and subsequent PTSD symptomology over a 2-year period.

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Risk Assessment for Posttraumatic Stress Disorder in a Cohort of U.S. Navy Personnel

Individuals in the military are often required to endure a high degree of stress as a result of demanding operational requirements or deployments. The threat of combat and capture presents an additional set of stressors for those working under conditions that may expose them to conflict, or in the case of medical corpsmen, the aftermath of conflict. A number of theoretical models have been developed to explain how premilitary and situational factors might influence individual adjustment to these types of stressors. Many of these studies have focused on symptoms of posttraumatic stress disorder (PTSD) among combat veterans (CVs) and repatriated prisoners of war (RPOWs). These studies generally have been retrospective, and the research participants included in them have not been representative of the military population as a whole (Brewin, Andrews, & Valentine, 2000). Using retrospective designs makes it possible to identify correlates of poor long-term psychological outcomes among CVs and RPOWs. However, it is not possible to verify what factors actually precede participants' symptoms. This study used a prospective design to explore Navy recruits' vulnerability to PTSD in relation to prior histories of trauma and to experiences of trauma and employment stress after entering the service.

LITERATURE REVIEW

PTSD is a relatively new diagnosis within mental health. The American Psychiatric Association formally recognized it in the third edition of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 1980). PTSD is a response to an identified traumatic experience. Three types of symptoms, all of which must be present for the diagnosis, characterize it. These include (a) reexperiencing the trauma, for example, through flashbacks; (b) avoidance of situations reminiscent of the traumatic experience, as well as numbing of emotional

responses; and (c) a state of hyperarousal or vigilance toward cues that might signal the recurrence of the traumatic event.

The theoretical concept and widespread acceptance of PTSD evolved out of a political and social need for a model of adaptation to severe stress that did not pathologize victims (Yehuda & McFarlane, 1995). PTSD was originally conceived as a normative, but extreme, reaction to severe trauma. Given a critical level of trauma, normal persons would experience the syndrome. As an expected reaction to an identifiable environmental stressor, PTSD should be distinct from other types of psychiatric disorders with roots in genetics or early development.

Researchers have documented elevated rates of PTSD among people who have survived a number of different types of traumatic events. Brewin, Andrews, Rose, and Kirk (1999) identified PTSD among 20% of a group of victims of violent assaults. Studies of combat veterans have also documented rates of 15% to 36% (Sutker, Bugg, & Allain, 1990). Large percentages of the general population have experienced a traumatic event that might lead to PTSD (Merrill, Hervig, & Newell, 1995; Merrill, Newell et al., 1998; Stander, Olson, & Merrill, 2002). Resnick, Kilpatrick, Dansky, Saunders, and Best (1993) interviewed a nationally representative sample of women to find out how many had been victims of a serious crime (rape, sexual or physical assault, homicide of a friend or family member) or had experienced a life-threatening situation (natural disaster, serious accident, injury). They found that 69% had experienced at least one event of this severity. Among those with a history of a traumatic event, the lifetime rate of PTSD was 18%. About 7% reported qualifying symptoms within the previous 6 months.

The severity of the traumatic stressor is generally related to subsequent rates of PTSD in a dose-response pattern (King, King, Foy, Keane, & Fairbank, 1999). Some of the highest rates, for instance, have been documented among RPOWs. Kluznik, Speed, Van Valkenburg, and

Magraw (1986) reported on the adjustment of 188 World War II POWs 40 years after repatriation. They found a lifetime incidence rate for PTSD of 67% among them. Similarly, Zeiss and Dickman (1989) evaluated 442 World War II RPOWs and found 56% had suffered serious symptoms of PTSD.

At the present time, researchers have amassed a considerable amount of valuable information regarding PTSD. However, much of this has challenged the early conceptual model of the disorder. Yehuda and McFarlane (1995) summarized some of these challenges. For example, epidemiological studies of the prevalence of PTSD clearly have shown that everyone who survives a traumatic event will not develop the disorder. It appears to be rather the exception than the rule. Although the severity and characteristics of the pivotal trauma are important predictive factors in PTSD outcomes, a number of risks for the illness have been identified that both precede and follow the triggering event (Schwarz, 2002). Demographic characteristics, such as gender and socioeconomic status, genetic vulnerability, and exposure to abuse or violence prior to the critical trauma are all correlated with the development of PTSD (Bremner, Southwick, Johnson, Yehuda, & Charney, 1993; Breslau, Davis, Andreski, Peterson, & Schultz, 1997; Fullerton et al., 2001; Stein, Jang, Taylor, Vernon, & Livesley, 2002). Subsequent stressful events and the viability of social support networks following traumatic exposure are also predictive (Wolfe et al., 1998).

Risk Factors for PTSD Among Military Populations

Research among war veterans has identified a number of factors that may indicate a vulnerability to PTSD among military personnel exposed to combat or capture. Some of these variables include low socioeconomic status; family instability; negative experiences with parents; low scores on measures of intelligence and self-reports of problems in school; family

and personal histories of psychological problems, especially a history of dissociation; prior experiences of abuse or trauma; younger age at time of combat; exposure to more-severe combat, war atrocities, or harsh wartime conditions; traumatic experiences after returning from combat; and poor social support networks (Bremner et al., 1993; Engel et al., 1993; King et al., 1999; Macklin et al., 1998; O'Toole, Marshall, Schureck, & Dobson, 1998; Page, Engdahl, & Eberly, 1991; Pitman, Orr, Lowevnhagen, Macklin, & Altman, 1991).

Many of these risk factors are not unique to the military experience, and it is unclear whether military performance is correlated with PTSD symptoms. Pitman et al. (1991) looked at the precombat military records of Vietnam veterans and reported that there were no differences in prior military conduct or job performance comparing those who did versus those who did not develop PTSD. O'Toole et al. (1998) noted that Australian Vietnam veterans who developed PTSD were more likely to have reported unemployment prior to entering the military. They had more behavior problems before entering the service and more charges were pressed against them for improper conduct during Vietnam. However, these variables were no longer predictive of PTSD in multivariate analysis after controlling for family and individual history of psychiatric problems and for the level of combat veterans experienced. These studies explored the relationship between military performance and PTSD retrospectively. One of the goals of this study was to explore this relationship prospectively. Might symptoms of PTSD at the time of service entry subsequently be related to poorer military job performance?

King et al. (1999) published a report completing a series of studies on PTSD among Vietnam veterans that set forth a very compelling model of the disorder. The model depicted PTSD as a reaction to the total picture of an individual's life stress, available resources, and coping style. Using structural equation modeling, they found significant direct relationships for

prewar risk factors, war-zone stresses, and postwar recovery variables with PTSD. In addition to these direct relationships, there were interrelationships between these correlates. Prewar factors were significantly related to war-zone stress and postwar recovery variables. War-zone stress was also predictive of postwar variables. The authors suggested that each stressful experience in a person's life affects his or her resources and coping strategies as he or she approaches the next stressful event. Furthermore, the earliest risk factors for PTSD—low socioeconomic status, family instability, poor parental relationships, and a history of childhood trauma—combine to create a picture of general disadvantage and stress. Such an environment may make it difficult for some to build up the reservoir of internal and external coping resources necessary to negotiate extreme trauma.

The exact nature of the relationship between life-trauma history and the development of PTSD is somewhat complex (King, King, Foy, & Gudanowski, 1996; King et al., 1999). Existing research suggests that there are a number of mediating variables through which trauma history indirectly influences PTSD. First, prior trauma history is consistently related to revictimization, increasing the likelihood of experiencing a severely traumatic or life-threatening event (Merrill, 1993; Merrill, Hervig, & Milner, 1996; Merrill et al., 1995; Merrill et al., 1999). Second, a history of life stress can tax coping resources such as social support and lead to poor psychological adjustment and coping skills (Adams & Lehnert, 1997; Andrews, Brewin, Rose, & Kirk, 2000; Arata, 1999; Breslau, Chilcoat, Kessler, & Davis, 1999; Cohen & Miller, 1998; King et al., 1996; King et al., 1999; Leserman, Li, Hu, & Drossman, 1998; Walker et al., 1999; Wolfe, Scott, Wekerle, & Pittman, 2001).

In addition to mediated influences, early life stress may interact with subsequent trauma in the development of PTSD. Several studies have reported this type of effect, but the exact

nature of the interaction has been inconsistent. For instance, McCranie, Hyer, Boudewyns, and Woods (1992), surveyed veterans under treatment for PTSD and explored the importance of parental relationships in predicting symptom severity. There were no main effects, but there were interactions between fathers' inconsistent, strict, and hostile behaviors and the severity of veterans' combat experiences. Parenting was correlated with symptomology only among those who experienced moderate combat. Among those who experienced severe combat there was no relationship. Findings such as this suggest that stress-vulnerability factors lead to a susceptibility to PTSD even under conditions of moderate trauma (Pitman et al., 1991). Under conditions of severe trauma, prior vulnerability may be less important as the coping resources of the majority of persons are exceeded.

By contrast, some researchers have found that the relationship between premilitary trauma and PTSD is stronger at higher levels of combat exposure. King et al. (1996) reported that prior trauma and family instability directly predicted PTSD. These variables also indirectly influenced PTSD because they were predictive of greater combat severity and overall perceived stress in the war zone environment. Finally, there was an interaction effect, with a stronger relationship between prior trauma history and PTSD among male Veterans exposed to more extreme levels of combat. King, King, Fairbank, Keane, and Adams (1998) further studied PTSD among Vietnam veterans in relation to postwar trauma and resilience variables. They noted, again, that there was a relationship between postwar trauma and PTSD for male veterans who experienced high levels of combat stress. There was no relationship between subsequent trauma and PTSD for men who experienced low levels of combat during Vietnam service. However, directly comparing the effect sizes for these two groups did not yield a significant difference.

In their discussion, King et al. (1996) emphasized the importance of multiple experiences of trauma in the development of PTSD. Their results suggest that the relationship between trauma and PTSD is magnified as total life stress increases. In line with this, we have suggested that correlations between PTSD and trauma during the first 2 years of service will be significantly stronger among participants who have experienced the greatest number of traumatic events at baseline.

The nature of PTSD makes it difficult to effectively assess significant risk factors. Because the diagnosis requires the experience of a severely traumatic event, researchers have generally studied it retrospectively. It is obviously unethical to design experimental studies of phenomena such as combat and capture. On the other hand, prospective correlational studies are at a disadvantage since it is impossible to predict what segment of the population will experience severe trauma. Still, retrospective studies cannot explore temporal sequences of events. It is never possible to establish cause and effect, but it is particularly difficult to rule out competing hypotheses when antecedents cannot be distinguished from consequences.

This study used a prospective design to explore the dynamics of PTSD symptomology among a representative group of male and female enlisted Navy personnel. We expected that participants with histories of premilitary trauma would report significantly greater PTSD symptomology at baseline than would those without such histories, and that multiple types of trauma would uniquely contribute in predicting long-term symptomology. We expected premilitary PTSD symptomology to be predictive of poor adjustment and performance in the military, including higher attrition from service and decreased perceptions of military job satisfaction. Furthermore, premilitary victimization should moderate the relationship between stressful or traumatic experiences during military service and subsequent PTSD symptomology

during military service. Stress and trauma during military service should have a stronger correlation with the development of PTSD among participants reporting multiple premilitary trauma than among those without a history of such trauma.

Military Job Stress and the Risk of Trauma in Peacetime

In order to use a prospective design, we chose to study PTSD symptomology among a representative group of military personnel across a 2-year time period in relation to traumatic experiences likely to occur during peacetime conditions. There are several stressors that military personnel are likely to experience regardless of whether they are actually deployed. First, they share the same risks with civilians of experiencing a severe trauma, such as a violent crime, a serious accident, or a natural disaster. Second, the types of jobs individuals are required to perform during military service may expose them to stress and trauma. Some of these stressors might include long working hours, experiencing an accident during military duty, being aware of others who have been injured or killed during military duty, or acting as a caretaker for someone who has experienced significant trauma (Fontana & Rosenheck, 1998). There is some argument over whether factors such as ongoing job stress, which are not life-threatening or accompanied by extreme fear, should be considered in the development of PTSD. However, there is evidence that harsh environmental conditions may be even more important than combat trauma in the development of PTSD among Vietnam veterans (King, King, Gudanowski, & Vreven, 1995). Furthermore, from the perspective of a cumulative-life-stress model of PTSD these experiences should all contribute in creating a vulnerability to PTSD.

Research Objectives

This study analyzed data from the Naval Health Research Center (NHRC) Longitudinal Survey of Navy Recruits to evaluate relationships between risk factors, such as premilitary

trauma and preexisting symptomology, subsequent experiences during military service, and PTSD. At baseline, participants in this longitudinal survey were asked about their premilitary experiences of childhood sexual abuse, physical abuse, intimate partner violence, and life-threatening adult trauma such as car accidents and violent assault. They were also assessed for symptoms of PTSD. Subsequently they were followed over a 2-year period to assess (a) continuing symptoms of PTSD, (b) interim experiences of trauma and victimization, and (c) military job satisfaction, healthcare use, disciplinary action, and attrition from service.

Using these data we:

1. Assessed PTSD symptomology among a cohort of Navy recruits at the time they reported for basic training and documented the percentages of personnel whose symptoms met criteria for PTSD over their first 2 years of service.
2. Evaluated whether participants with histories of premilitary trauma had significantly greater PTSD symptomology than did those without such histories.
3. Assessed the relationship of PTSD symptomology with the military adjustment and job performance of Navy personnel during their first 2 years of service.
4. Explored whether experiences of premilitary victimization moderate the relationship between PTSD symptomology and trauma while in the service.

METHODS

Participants and Procedure

The NHRC Longitudinal Survey of Navy Recruits included 5,498 active duty enlisted personnel of whom 2,573 were women and 2,925 were men. At the time the study was initiated, the participants were between the ages of 17 and 35 years. The majority had a high school

diploma with no college experience (85%), they were single, without children (85%), and they reported that their race/ethnicity was Caucasian (61%).

Baseline data collection. Between June 1996 and June 1997 11,195 U.S. Navy recruits at the Recruit Training Command, Great Lakes, IL were surveyed (Merrill, 1993; Merrill et al., 1996; Merrill, Hervig, Milner, Newell, & Koss, 1998; Merrill et al., 1995; Merrill, Newell et al., 1998; Stander & Merrill, 2000). The survey was offered to all available recruits in gender-integrated units during their first week of training with response rates of 97% for men and 96% for women. Approximately half of the recruits were asked to provide identifying information in order to be included in the longitudinal study.

Longitudinal data collection. For participants who provided identifying information, Recruit Survey data were matched with military service records and with data from follow-up surveys conducted 6 months, 1 year, and 2 years after basic training. At each follow-up, a number of the longitudinal participants could not be resurveyed because they had been discharged from naval service, they did not have an accurate mailing address, or they had asked not to participate (6 months = 16%, 1 year = 22%, 2 years = 31%). Of those who were sent surveys, 45% (n = 2,085) responded at 6 months, 34% (n = 1,464) at 1 year, and 32% (n = 1,236) at 2 years.

It was possible to access data from military service records for 5,491 of the participants through the Career History Archival Medical and Personnel System (CHAMPS). This system contains information on active duty enlisted U.S. Navy personnel from accession to discharge and across multiple periods of service. CHAMPS data are compiled from Bureau of Navy Personnel data files and from data files provided by the Navy Medical Information Management Center. The CHAMPS variables that were used in this study are described further below.

Instruments

Individual and family background. At baseline, the Recruit Survey asked participants to provide personal demographic information regarding their birth date, gender, ethnicity, education, marital status, and number of children. They also answered questions about their family background including family income level and childhood family stability. A single item asked about family income: "What is your best guess of your family's total income last year (1, under $10,000 to 7, $75,000 or more)?" Family stability was estimated from 4 items asking how many years participants' (a) mothers and (b) fathers (including stepparents) were present in their homes as they grew up (range = 1 – 18) and from items asking how involved their (c) mothers and (d) fathers were in raising them (1, not at all, 5, Extremely). To adjust for differences in scale, questions regarding parental involvement were weighted by a factor of 4, and then all items were summed to form a composite family stability score.

From CHAMPS personnel files, some additional demographic and background information was available. Among these data were Armed Forces Qualification Test scores (AFQT). The AFQT is the standard entrance exam required for recruitment into the Navy. It is used as a screening device in combination with other factors, in particular, a high school diploma (Cooke & Lockman, 1987). Among participants in this study, AFQT scores ranged from 23 to 99.

Childhood abuse. At baseline, self-reports of childhood physical and sexual abuse were assessed using two items. These were "Before the age of 18, were you ever sexually abused?" and "Before the age of 18, were you ever physically abused?" Responses were dichotomous (yes/no). Self-reported verbal abuse was based on responses to two additional items within the Parental Support Scale (Fromuth, 1986). These items were "My mother was verbally abusive to me" and "My father was verbally abusive to me." Responses to the parental support scale were

made on a 5-point scale from 1, agree to 5, disagree. For this study, we categorized participants as victims of emotional abuse if they answered 1, agree for either parent. Responses between 2 and 5 were categorized as nonabuse.

Other traumatic experiences. The baseline survey included a 17-item modification of the Traumatic Events Checklist (TEC) (Singer, Anglin, Song, & Lunghofer, 1995). This checklist assessed additional victimization, including (a) rape or sexual assault; (b) slapping, hitting, punching, or battering in an intimate relationship; (c) violent assault in other than an intimate relationship; (d) muggings; (e) knife attacks; (f) shootings; and (g) any other experiences that caused participants to fear for their lives or become physically injured. It also asked whether participants had ever witnessed (h) a sexual assault, (i) a physical assault, or (j) another person becoming seriously injured, (k) killed, (l) shot at, or (m) stabbed. Some items developed for the Recruit Survey were added to this checklist. These asked about (n) auto accidents, (o) fires, (p) earthquakes, and (q) hurricanes/tornadoes/storms/typhoons/floods that caused injury or invoked fear for one's life. Participants indicated whether they had ever experienced any of these events (response: yes/no).

The TEC was included at each follow-up with slight modification. Two new traumatic events, witnessing injury or fatality in combat and experiencing sexual harassment at work, were added. Violence within an intimate relationship was dropped. However, data regarding intimate partner violence was still available, because participants were asked to fill out the Conflict Tactics Scale (CTS) (Straus, 1990). In analyzing trauma during military service we used a dichotomous variable, identifying

participants who reported any experiences included in the CTS very severe violence scale.

Posttraumatic stress disorder. At baseline and follow-up, the Recruit Survey used the 17-item version of the Los Angeles Symptom Checklist (LASC) representing symptoms that have been most strongly associated with PTSD (King, King, Leskin, & Foy, 1995). Respondents rated the extent to which each symptom was a problem for them prior to basic training on a 5-point scale, ranging from 0, no problem to 4, extreme problem. The 17 symptoms can be combined into 3 subscales representing 3 classes of symptoms required for a diagnosis of PTSD. Using standard scoring for the LASC, participants have elevated subscale scores if they give a response of 2 or more to any of 3 Reexperiencing Trauma symptoms, to at least 3 of 6 Avoidance & Emotional Numbing symptoms, and to at least 2 of 8 symptoms of Hyperarousal. Participants with elevated scores on all 3 subscales meet criteria for PTSD. Those with elevations on only one or two have partial PTSD, while participants are classified as asymptomatic if none of the subscales are elevated.

In addition to the LASC our analyses included the Trauma Symptom Inventory (TSI), which participants filled out at baseline and at each follow-up for the Recruit Survey (Briere, 1995). The TSI is a 100-item measure with 3 validity subscales and 10 clinical subscales assessing a wide range of psychological symptoms. These include symptoms normally associated with PTSD and Acute Stress Disorder. The 10 clinical scales have been internally consistent across diverse populations with alpha coefficients averaging between .84 and .87. The TSI also exhibits reasonable convergent, predictive, and incremental validity (Briere, 1995). Scores for the clinical scales are computed by summing across responses to specific subsets of 8 to 9 items each. Based on the standard deviations and means of a normative sample for the TSI, raw scores

on each scale can be converted to T scores. A T score of 65 is the clinical cutoff for all 10 subscales.

Military job stress. The relative stress experienced by participants in their military employment was estimated based on their enlisted ratings obtained from CHAMPS. The relative level of 5 different types of stress was estimated for each job rating by a panel of 3-10 master chiefs and detailers with oversight for that rating. The 5 types of stress assessed were (1) exposure to physical danger, (2) responsibility for others, (3) long hours and overtime, (4) frequent moves or deployments, and (5) the likelihood of witnessing injury to others. Responses were given on a 4-point scale from 1, not stressful to 4, very stressful. Estimates of the stress involved in each rating were averaged to create 5 relative job stress scales. Finally, scores on these scales were summed to calculate an overall job stress index.

Military job satisfaction. To evaluate military job satisfaction, participants were asked to endorse 5 items: (a) I am generally satisfied with my current job; (b) In general, I like the work I do in the Navy; (c) I am satisfied with my physical working conditions; (e) I enjoy my career in the Navy; and (f) I plan to re-enlist in the Navy. Responses to these job satisfaction items were made on a 5-point scale ranging from strongly disagree to strongly agree. Participants' responses to all 5 items were averaged to create a satisfaction scale. We evaluated the internal reliability for the scale at 6 months, 1 year, and 2 years. Cronbach's alpha was consistently high, ranging from .87 to .91.

Military performance. CHAMPS records identified all those who prematurely attrited from Navy service and who were ever demoted. A record of demotions participants received was also available. At each follow-up, the Recruit Survey asked whether participants had been "put on report" and if they had been disciplined under the Uniformed Code of Military Justice

(UCMJ) with response options from 0, never to 3, three or more times. For these analyses we summed participants' responses to both disciplinary items.

Healthcare use. In follow-up questionnaires respondents were asked to report the number of times from 0 to 10 plus in the last 6 months that they had been treated by a healthcare professional under a number of specific circumstances. These included hospital stays, emergency room treatment, outpatient surgery, treatment for injury, treatment for sexually transmitted disease, visits to sick call, other outpatient care, and, for women, gynecological and obstetric care. We computed a composite healthcare variable (women: range = 0 – 90, men: range = 0 -70) by summing across these items. Participants were also asked about symptoms of illness, including the flu and symptoms that might be related to stress, such as abdominal, facial, or back pain, headaches, diarrhea, and constipation. We created a composite variable for physical symptoms by counting the number of different symptoms experienced in the last 6 months (range = 0 – 7).

Social support. At follow-up, participants were asked 6 questions about the level of social support they had experienced in the previous 6 months. They were asked how many people, from 1 to 9 or more, that they could count on (a) to be dependable when they needed help, (b) to help them feel more relaxed when they felt pressured or tense, (c) to accept them totally, (d) to care regardless of what was happening to them, (e) to help them feel better when they were feeling down, and (f) to console them when they were upset. For our analyses, we computed a total social support score by averaging responses to these questions.

RESULTS AND DISCUSSION

PTSD symptomology among a cohort of Navy recruits from basic training through the first 2 years of service.

Baseline symptomology. As shown in Table 1, 15% of all participants reported symptoms that met the LASC classification for PTSD. An additional 18% were classified with partial PTSD. In comparison with men, 6% more women were classified with partial PTSD and 5% more women were classified with full PTSD. We used Kendall's tau-c to estimate the size of the correlation between gender and PTSD symptomology. The relationship was (.11) comparable to the average effect size (.13) for gender among studies of civilians in a meta-analysis by Brewin et al. (2000).

The average total score for participants on the LASC was 12.85 (SD = 11.69). This is below means reported in published studies of combat veterans, battered women, abuse survivors, and psychiatric outpatients, range = 25.21 – 49.82 (L. A. King et al., 1995). It is also lower than the mean reported in a study of incarcerated juveniles (M = 21.39, SD = 12.65) and lower than that found for a representative group of students from an urban school district, M = 16.19, SD = 12.57 (Burton, Foy, Bwanausi, Johnson, & Moore, 1994; Foy, Wood, King, King, & Resnick, 1997; L. A. King et al., 1995). Only one available study of adolescents from continuation and alternative schools reported a mean similar to that found here, M = 12.29, SD = 10.63 (L. A. King et al., 1995).

Table 1

Percentages of Participants Meeting Los Angeles Symptom Checklist (LASC) Criteria for Posttraumatic Stress Disorder (PTSD) During the First Week of Navy Basic Training

PTSD Symptomology	Women	Men	Total
Reexperiencing	45%	34%	39%
Avoidance	24%	19%	22%
Arousal	49%	39%	43%
PTSD categorization			
No PTSD	61%	72%	67%
Partial PTSD	21%	15%	18%
PTSD	18%	13%	15%
Total score			
M (SD)	14.25(12.13)	11.58(11.13)	12.85(11.69)

Note. More women than men ($p < .001$) met symptom criteria for all 3 LASC subscales and higher percentages of women were categorized with partial and full PTSD, $\chi^2(2, n = 5254) = 70.53$, $p < .001$; $t(5,253) = -8.35$, $p < .001$. Due to missing data on the LASC, *n*'s range from 2,769 to 2,794 for men and from 2,485 to 2,521 for women.

Table 2 shows the percentages of male and female participants with TSI subscale scores above the clinical cutoff, a T score of 65 or greater. This cutoff is 1.5 standard deviations above the mean score for the study group used as the norm for the TSI. Approximately 6% to 7% of a population comparable to this norm should have scores above this cutoff. This is about the percentage of Navy Recruits, which we found in the clinical range for Anxious Arousal (6%), Depression (8%), and Sexual Concerns (8%). On the other 7 subscales, 10% to 20% of the participants were above the cutoff, with the highest percentage for Dysfunctional Sexual Behavior. We found several significant gender differences among the TSI subscales in Table 2. However, the only difference of any substantial size was in sexual concerns, where 7% more

women than men had scores above the clinical cutoff. Interestingly, there were no significant gender differences in Depression, Anger-Irritability, or Tension Reduction Behavior.

Table 2

Percentage of Participants With Scores Above the Clinical Cutoff for the Trauma Symptom Inventory Clinical Subscales

	Women	Men	Total
Anxious Arousal**	7%	5%	6%
Depression	7%	9%	8%
Anger-Irritability	10%	10%	10%
Intrusive Experiences*	11%	13%	12%
Defensive Avoidance*	14%	12%	13%
Dissociation*	15%	14%	14%
Sexual Concerns***	12%	5%	8%
Dysfunctional Sexual Behavior*	19%	21%	20%
Impaired Self Reference*	11%	13%	12%
Tension Reduction Behavior	15%	15%	15%

Note. Asterisks indicate significant gender differences in the percentage of participants with scores in the clinical range. Due to missing data, *n*'s vary from 2519 to 2,544 for women and from 2,803 to 2,849 for men. *$p < .05$. **$p < .01$. ***$p < .001$.

Longitudinal PTSD symptomology. PTSD prevalence rates among all participants responding to each wave of the Recruit Survey are listed in Table 3. As at baseline, there were significant gender differences in PTSD classification at 6, 12, and 24 months. However, at 12 and 24 months significant differences were only associated with participants classified with partial PTSD. In the final two follow-up surveys there were no significant differences in the number of men and women classified with full PTSD.

Looking at Table 3, there do not appear to be systematic differences in PTSD rates across time. However, we subtracted participants' total LASC scores at baseline from 6-month scores, 6-month from 1-year scores, and 1-year from 2-year scores. We then used t tests to determine whether any of the 3 resulting differences had averages significantly different from zero. We found small differences between baseline and 6 months (women, $M_{dif} = 1.24$, $t[1,007] = 3.38$, $p < .001$; men, $M_{dif} = 1.20$, $t[979] = 3.29$, $p < .001$) and between 1 year and 2 years (women, $M_{dif} = 1.00$, $t[419] = 2.10$, $p < .05$; men, $M_{dif} = 1.33$, $t[339] = 2.43$, $p < .05$). There were no significant differences comparing 6-months with 1-year.

Table 3

Percentages Meeting Criteria for Posttraumatic Stress Disorder (PTSD) on the Los Angeles Symptom Checklist (LASC) Across the First 2 Years of Navy Service

PTSD Symptomology	Baseline	6 Months	1 Year	2 Years
None				
Women	61%	56%	61%	58%
Men	72%	70%	70%	67%
Partial				
Women	21%	25%	25%	24%
Men	15%	17%	18%	16%
PTSD				
Women	18%	19%	14%	18%
Men	13%	13%	12%	17%

Note: Baseline $n = 5,254$; 6 months $n = 2,047$; 1 year $n = 1,449$; 2 years $n = 1,219$.

In order to illustrate these longitudinal differences, Table 4 lists PTSD symptomology for participants who remained in the study and responded to the 2-year follow-up. Since there were no significant differences in 6-month and 1-year PTSD rates, we combined data across these two survey times. In combining data, we averaged continuous LASC scores and used the latest

available score for categorical variables. The results in Table 4 show a trend for PTSD symptomology to increase somewhat over the study period. Eight percent more women and 9% more men reported either partial or full symptoms of PTSD after 2 years.

Table 4

Percentages Meeting Criteria for Posttraumatic Stress Disorder (PTSD) on the Los Angeles Symptom Checklist Among Participants Remaining in the Study after 2 Years

	Basic Training		1 Year		2 Years	
PTSD Symptomology	Women	Men	Women	Men	Women	Men
Reexperiencing	41%	31%	46%	34%	50%	40%
Avoidance	19%	15%	19%	15%	21%	21%
Arousal	44%	34%	49%	36%	50%	42%
PTSD Categorization						
None	66%	76%	62%	74%	58%	67%
Partial	20%	14%	23%	15%	24%	16%
PTSD	14%	10%	15%	11%	18%	17%
Total Score						
M	12.54	10.40	13.50	11.27	14.31	12.96
SD	10.80	10.08	11.42	11.31	12.68	12.58

Note: Due to nonresponse at 1 year and to missing data on the LASC, *n*'s vary from 554 to 653 for women and from 474 to 571 for men. In a 2 (sex) by 3 (survey time) repeated measures analysis of variance there were significant differences based on time, $F(2, 991) = 16.89$, $p < .001$, and gender, $F(1, 992) = 9.74$, $p < .01$. There was no significant interaction between time and gender. In post hoc t tests, PTSD symptomology was significantly different ($p < .01$) at all 3 survey times for men. For women, it was only significantly different between baseline and 2 years.

These results suggest that among individuals PTSD increased slightly over time, but that in the total population there was no systematic change. Disproportionate attrition from Navy service among personnel with high initial symptoms of PTSD may account for this dynamic. There were significant differences in baseline PTSD symptomology comparing those who

attrited from service in the first 2 years with those who remained on active duty, women: $\chi^2(2, n = 2{,}478) = 39.23$, $p < .001$; men: $\chi^2(2, n = 2{,}765) = 51.31$, $p < .001$. Twelve percent more women and 13% more men were categorized with either partial or full PTSD at baseline among attrites (women: 48%, men: 38%) in comparison with nonattrites (women: 36%, men: 25%). We considered whether nonresponse to the Recruit Survey might also have influenced estimates of the longitudinal prevalence of PTSD among participants. However, after excluding those who attrited from service, there were no significant differences in the total percentages categorized at baseline with partial or full PTSD comparing those who did (women: 34%, men: 24%) versus those who did not participate (women: 37%, men: 25%) in the 2-year follow-up.

The relationship of premilitary trauma with PTSD symptomology.

Type of trauma and PTSD. Table 5 lists the percentages of participants with PTSD among those who experienced each of 20 different types of trauma. There were significant relationships between PTSD and every type of trauma except severe earthquakes. We did find that severe fires and muggings were only significantly related to PTSD for men, and that having witnessed a sexual assault was only significantly related to PTSD for women. However, directly comparing the confidence intervals for the odds ratios listed in Table 5, none of the 20 types of trauma had a significantly stronger relationship with PTSD for one sex or the other.

In addition to the bivariate relationships shown in Table 5, we evaluated which types of trauma might be uniquely related to PTSD symptoms in multivariate analysis. We used logistic regression to estimate the likelihood that male and female participants would be categorized with PTSD on the LASC with all 20 types of trauma as predictors. Comparatively few traumatic experiences contributed uniquely in estimating the likelihood of PTSD (see Table 6). None of the variables that involved witnessing traumatic events were significant. With only one exception,

none of the events that involved natural disasters or accidents contributed significantly. The one exception was life-threatening auto accidents.

"Other" unspecified traumatic experiences did contribute significantly, suggesting that the list of traumatic events given here, although extensive, did not cover all of the experiences relevant in the development of PTSD. But, most of the types of trauma that remained significantly related to PTSD in multivariate analysis involved personal attacks on participants by other persons. In particular, adult sexual assault, intimate partner violence, and parental verbal aggression in childhood were consistently predictive of PTSD for both genders. These findings are consistent with past research suggesting that it is important to distinguish between trauma that is interpersonal and/or criminal versus accidents, natural disasters, or events that are merely witnessed (Green et al., 2000; Stein et al., 2002). The latter appear to have less of a relationship with PTSD than the former.

In this regression, childhood sexual abuse and assaults with a gun were only significant in the equation for women, while childhood physical abuse and assaults with a knife were only significant for men. We considered whether childhood sexual abuse might be more important for women, and childhood physical abuse might be more important for men in relationship to PTSD. Before concluding that these types of trauma were more strongly related to PTSD for one gender or another, we directly tested the differences in the size of the relationships. In this case the results were not significant, indicating no reliable gender differences. Because sexual trauma has been particularly important in relationship to PTSD among women in past research, we further compared the size of the relationships for childhood sexual abuse and adult sexual assault with those for all other types of trauma in this analysis (Fontana & Rosenheck, 1998; Wolfe et al., 1998). There were again no significant differences for either men or women.

Table 5

Percentage of Participants Meeting Los Angeles Symptom Checklist Criteria for Posttraumatic Stress Disorder at Baseline in Relation to Specific Trauma Histories

	Women			Men		
	Nonvictim	Victim	OR	Nonvictim	Victim	OR
Child sexual abuse	13%	30%	2.79***	13%	25%	2.29***
Child physical abuse	14%	31%	2.67***	11%	25%	2.66***
Child verbal abuse	15%	29%	2.26***	11%	26%	2.67***
Sexual assault	13%	31%	3.14***	13%	36%	3.90***
Spouse/partner violence	14%	32%	3.02***	12%	24%	2.49***
Violent assault	15%	28%	2.23***	11%	20%	1.96***
Auto accident	15%	29%	2.33***	12%	19%	1.82***
Severe fire	17%	22%	1.35	13%	28%	2.63***
Severe earthquake	17%	24%	1.52	13%	18%	1.45
Severe storm	16%	25%	1.72***	12%	19%	1.68***
Attacked with a gun	16%	38%	3.18***	11%	19%	1.85***
Attacked with a knife	17%	31%	2.19***	11%	25%	2.63***
Mugged	17%	22%	1.34	12%	22%	2.09***
Other	15%	32%	2.65***	11%	22%	2.30***
Witness sexual assault	17%	29%	2.02**	13%	18%	1.49
Witness physical assault	13%	26%	2.42***	10%	17%	1.89***
Witness severe injury	15%	25%	1.93***	11%	17%	1.74***
Witness someone killed	17%	26%	1.79***	12%	18%	1.61***
Witness gun attack	15%	28%	2.21***	12%	18%	1.63***
Witness knife attack	16%	29%	2.18***	12%	19%	1.80***

Note. OR = odds ratio. Women, n = 2,372 – 2,498, Men, n = 2,564 - 2789. *p < .05, **p < .01, ***p < .001.

Table 6

Logistic Regression Relating Specific Trauma Experiences With the Likelihood of Posttraumatic Stress Disorder (PTSD) Categorization on the Los Angeles Symptom Checklist

	Women		Men	
Trauma	B	OR	B	OR
Childhood sexual abuse	0.38*	1.46		
Childhood physical abuse			0.36*	1.44
Childhood verbal abuse	0.46**	1.58	0.71***	2.04
Adult sexual assault	0.49**	1.63	0.80*	2.22
Intimate partner violence	0.59***	1.80	0.67***	1.96
Life-threatening auto accident	0.64***	1.89	0.31*	1.36
Shot or shot at with gun	0.58**	1.78		
Attacked with a knife			0.41*	1.51
Other life-threatening trauma	0.47**	1.59	0.45**	1.57

Note. OR = odds ratio. Only variables that contributed significantly are listed in the table. *p < .05, **p < .01, ***p < .001. Men, *n* = 2,463, Women, *n* = 2,228.

Multiple Trauma and PTSD. Past research suggests that those who have experienced trauma are likely to have had multiple experiences, and that PTSD rates may be highest among persons who have experienced multiple interpersonal traumas (Green et al., 2000; King et al., 1998; Martin, Rosen, Durand, Knudson, & Stretch, 2000). We computed the total number of interpersonal traumas reported by participants, including childhood sexual, physical, and verbal abuse, as well as adult intimate partner violence, sexual assault, physical assault, knife attacks, gun attacks, and muggings; 57% of the participants had experienced at least one of these events. Of those who had experienced any interpersonal trauma, 60% reported multiple types of experiences.

In Table 7 we show the percentage of participants categorized with PTSD based on the total number of interpersonal traumas reported. Only 8% to 9% of those who reported no interpersonal trauma were categorized with PTSD, while 44% of men and 48% of women were identified with PTSD among those who reported 5 or more types. Interestingly, we found a relationship between average total PTSD symptom scores and variability among symptom scores. The correlation between the 12 average scores listed in Table 7 and their standard deviations was $r = .93$, $p < .001$. Among those who did not report any interpersonal trauma, overall symptomology was lowest and PTSD outcomes were most homogenous. Among those reporting 5 or more types of interpersonal trauma, overall symptomology was highest, but variability in PTSD outcomes was also the greatest.

Correlations between premilitary trauma and PTSD at followup. Table 8 shows that there were significant correlations between total premilitary interpersonal trauma and PTSD symptom scores across all survey time periods. We further evaluated whether total trauma history might be related to changes in PTSD symptoms from one survey time to another. We subtracted baseline symptom scores from 6-month scores (change 1), 6-month from 1-year scores (change 2), and 1-year from 2-year scores (change 3). We correlated the differences with total interpersonal trauma history, but there were no significant relationships. This suggests that total premilitary trauma is related to baseline symptoms, which in turn are related to symptoms at follow-up. This chain of relationships accounts for the correlation between premilitary trauma and total PTSD symptomology at follow-up. To explain the change in symptoms over time, it may be necessary to consider stress and trauma experienced after entering the service.

Table 7

Total Interpersonal Trauma History and Posttraumatic Stress Disorder (PTSD), as Assessed by the Los Angeles Symptom Checklist (LASC), Among Participants in Basic Training

Total Interpersonal Traumas	PTSD Classification	*M*	*SD*
None			
Women	9%	9.95	9.68
Men	8%	8.62	9.28
One			
Women	13%	13.74	11.27
Men	12%	11.60	10.92
Two			
Women	23%	17.01	12.04
Men	15%	13.71	11.25
Three			
Women	25%	17.35	12.94
Men	21%	15.77	12.10
Four			
Women	37%	21.34	12.58
Men	30%	18.26	11.72
Five or More			
Women	48%	25.28	14.43
Men	44%	23.51	15.06

Note. There was a significant relationship between PTSD classification and total interpersonal trauma history for men, $\chi^2(5, n = 2{,}691) = 140.81$, $p < .001$, and women, $\chi^2(5, n = 2{,}449) = 217.16$, $p < .001$. This table includes only participants with complete data for continuous and categorical LASC scores.

Table 8

Correlations Between Total Premilitary Interpersonal Trauma History and PTSD Symptomology at Baseline and after 6 Months, 1 Year, and 2 Years

Survey	Women	Men
Baseline	.37	.32
6-months	.32	.23
1 year	.24	.27
2 years	.26	.22

Note. Women: n = 642 – 2,464, Men: n = 561 – 2,703. Correlations were all significant at $p < .001$.

The relationship of PTSD symptomology with personal adjustment and job performance during the first 2 years of service.

Satisfaction with military employment. Participants' military job satisfaction varied across the 2-year study period, with 39% to 49% of the participants agreeing that they were satisfied with their current jobs. Forty-three to 50% said they liked the work they did for the Navy, 42% to 53% were satisfied with their working conditions, and 31% to 47% agreed that they enjoyed their Navy careers. About 18% to 21% agreed that they would re-enlist (see Table 9). Analyzing average responses to all 5 questions in a 3 (time) by 2 (sex) repeated measures ANOVA, we found no significant main effect or interaction for sex. There was a significant main effect for time, $F(2,1264) = 45.59$, $p < .001$. Satisfaction declined slightly over the first 2 years. About half of the participants (52%) had lower overall satisfaction at 1 year than at 6 months, and 54% had lower average satisfaction scores at 2 years than at 1 year. Satisfaction went up for only about one third of the participants (6 months to 1 year: 35%, 1 year to 2 years: 33%).

In Table 9 we looked at correlations between symptoms of PTSD and composite job satisfaction scores. In the first half of the table, total PTSD symptoms were significantly

correlated with satisfaction. As might be expected, participants with higher symptoms tended to have lower satisfaction.

Table 9

Correlations Between PTSD Symptomology and Overall Military Job Satisfaction During the First 2 Years of Service

	Job Satisfaction		
Total PTSD symptoms	6 Months	1 Year	2 Years
	Women		
Baseline	-.17***	-.12***	-.07
6 months	-.30***		
1 year		-.22***	
2 years			-.18***
	Men		
Baseline	-.11***	-.17***	-.16***
6 months	-.33***		
1 year		-.25***	
2 years			-.32***

Note. ***$p < .001$. Women, $n = 1{,}024 – 647$, Men, $n = 1{,}023 - 549$.

Healthcare use and symptoms of illness. Table 10 shows the average number of healthcare use events and physical symptoms reported by participants at each follow-up. Within a given 6-month period, participants reported using healthcare services about 2 to 3 times, and they reported experiencing about 2 to 3 different symptoms of physical illness. Average healthcare use was clearly higher for women. However, gynecological care and obstetric care were included in these figures making direct comparison misleading. Excluding these two types

of care, there were still significant gender differences, with women reporting 1.71 to 2.79 more instances of healthcare use ($p < .001$). There were also significant gender differences in symptoms of illness with mean differences of .57 to .63 ($p < .001$).

Relationships between physical health and mental and emotional disorders, including PTSD, have frequently been documented in past research (Barrett et al., 2002; Larson, Booth-Kewley, Merrill, & Stander, 2001). Table 11 lists correlations between PTSD scores, healthcare use, and physical symptoms among the Recruit Survey participants. PTSD symptomology at the time of service entry was prospectively correlated with physical health and healthcare use across 2 years of service.

Table 10

Average Number of Healthcare Events and Symptoms of Illness Reported at Follow-up.

Health Composite	6 Months	1 Year	2 Years
		Women	
Symptoms	3.27	3.28	3.95
Physical healthcare	4.86	5.07	7.88
		Men	
Symptoms	2.63	2.76	3.38
Physical healthcare	2.07	2.39	3.73

Note: Women, n = 1,039 - 655, Men, n = 1,016 = 567.

Table 11

Correlations Between Posttraumatic Stress Disorder (PTSD) Symptomology, Healthcare Use, and Symptoms of Physical Illness During the First 2 Years of Service.

	Physical Symptoms			Healthcare Use		
PTSD	6 Months	1 Year	2 Years	6 Months	1 Year	2 Years
			Women			
Baseline	.25***	.22***	.21***	.20***	.15***	.16***
6 months	.38***			.24***		
1 year		.39***			.24***	
2 years			.43***			.27***
			Men			
Baseline	.25***	.27***	.24***	.07*	.15***	.09*
6 months	.44***			.24***		
1 year		.41***			.32***	
2 years			.42***			.22***

Note. *$p < .01$, ***$p < .001$. Women, n = 1,025 - 643, Men n = 1,005 – 544.

Disciplinary action. Very few Recruit Survey participants (6%) had ever received a demotion, although slightly more men (8%) than women (5%) had received one, $\chi^2(1, n = 5{,}491) = 17.70$, $p < .001$. Those who received a demotion during the study period consistently had higher total PTSD symptom scores than did other participants (see Table 12). However, none of the relationships between the likelihood of having received a demotion and PTSD classification at baseline or follow-up for men were significant. PTSD symptom scores were significantly higher at baseline, 6 months, and 1 year ($p < .05$) among women who had been demoted. It is likely that differences at final follow-up would have been significant had more women

responded. Two-year Recruit Survey data were only available for 19 women who had ever received a demotion.

At both first and second follow-up, 10% of the participants reported either having been put on report or having received a UCMJ punishment. At 2 years, 14% reported receiving this type of disciplinary action. At every survey time, more men than women reported disciplinary action, $p < .01$ (women: 8% - 11%, Men 12% - 17%). Table 13 shows that there were significant correlations between the number of disciplinary actions reported and symptoms of PTSD. Those who were categorized as PTSD positive at baseline were 1.62 times more likely to report military disciplinary action at final follow-up (19%) than were participants classified as PTSD negative (13%), $p < .05$.

Table 12

Average Total Symptom Scores for Posttraumatic Stress Disorder Among Participants In Relation to Whether They Had Ever Been Demoted

	Women		Men	
Survey Time	Never Demoted	Demoted	Never Demoted	Demoted
Baseline	14.12	16.77	11.54	11.87
6 months	14.57	19.33	11.79	14.05
1 year	12.95	20.96	11.49	13.91
2 years	14.18	18.68	12.78	17.27

Note. Women, n = 2,489 – 650, Men, n = 2,760 – 571. Mean differences were only significant ($p < .05$) for women at baseline, 6-month follow-up and 1-year follow-up.

Table 13

Correlations Between Military Disciplinary Action Received Within the Last 6 Months and Symptoms of Posttraumatic Stress Disorder

	Military Disciplinary Action[a]		
Total PTSD Symptoms	6 Months	1 Year	2 Years
	Women		
Baseline	.09**	.08*	.08*
6 months	.19***		
1 year		.08*	
2 years			.19***
	Men		
Baseline	.09**	.05	.08
6 months	.15***		
1 year		.21***	
2 years			.17***

Note. [a]Total number of times participants were on report or received a Uniformed Code of Military Justice punishment in the last 6 months. Women, n = 1,015 - 647, Men, n = 1,008 - 543. *p < .05, **p < .01, ***p < .001.

Attrition from service. During the 2-year time frame of the Recruit Survey, 24% of the participants attrited from the Navy prior to the completion of their commitments. Table 14 shows that baseline PTSD classification and total PTSD symptom scores were related to higher attrition rates. The highest attrition occurred among participants with total PTSD symptom scores over 40 (women, n = 99, men, n = 65), half of whom left the Navy prior to fulfilling their commitments.

Table 14

Percent Attrition Within the First 2 Years of Military Service Among Participants by Posttraumatic Stress Disorder Categorization

PTSD	Women	Men	Total
Classification[a]			
Positive	20%	20%	20%
Partial	26%	29%	27%
Negative	35%	36%	35%
Total score[b]			
0 - 10	19%	19%	19%
11 - 20	24%	28%	26%
21 - 30	29%	32%	30%
31 - 40	36%	34%	35%
41 Plus	49%	51%	49%

Note. [a]Women: $\chi^2(2, n = 2{,}482) = 41.66$, $p < .001$, Men: $\chi^2(2, n = 2{,}766) = 49.67$, $p < .001$. [b]Women: $\chi^2(4, n = 2{,}489) = 63.61$, $p < .001$, Men: $\chi^2(4, n = 2{,}760) = 69.43$, $p < .001$.

Overall, attrition rates were the same for men and women with no significant differences based on gender. However, there were gender differences in the reasons for which participants left the service (see Table 15), $\chi^2(8, n = 1{,}330) = 214.42$, $p < .001$. More men than women left due to drug/alcohol problems (women: 11%, men: 27%) and because of misconduct (women: 16%, men: 28%), whereas more women left due to a physical condition or disability (women: 10%, men: 6%) and, in particular, for family hardship (women: 23%, men: 1%). A substantially higher percentage of women who attrited received honorable (45%) discharges than did men (15%), $\chi^2(3, n = 1{,}330) = 147.60$, $p < .001$.

There were no significant differences among participants who attrited from service in the type of discharge received (honorable, general, uncharacterized, other than honorable) comparing those who were versus those who were not classified with PTSD at baseline. Further, the reason given for discharge was unrelated to baseline PTSD classification for men. It was significantly related for women, $\chi^2(8, n = 603) = 22.43$, $p < .01$. In Table 15 we have listed the percentages of participants who attrited for 9 different reasons based on whether they were ever categorized with PTSD at baseline or follow-up. In comparison with those never categorized with PTSD, women who were PTSD positive at baseline were more often discharged for personality disorders and less often for family hardship or drug/alcohol use.

Table 15

Reasons for Attrition Within the First 2 Years of Service Based on Whether Participants Were Ever Categorized with Posttraumatic Stress Disorder

	Women		Men	
Reasons for Attrition	No PTSD	PTSD	No PTSD	PTSD
Misconduct	16%	16%	28%	24%
Condition/disability	10%	10%	7%	4%
Family hardship	25%	16%	2%	0%
Personality disorder	21%	31%	20%	21%
Drugs or alcohol	12%	5%	25%	31%
Military performance	2%	1%	3%	7%
Weight/physical stds.	6%	7%	5%	5%
Erroneous entry	5%	9%	7%	7%
Other	3%	5%	3%	1%
Group *n*	449	154	537	131

Moderating effects on the relationship between PTSD symptomology and trauma experienced during military service.

We hypothesized that premilitary victimization history should moderate the relationship between stressful or traumatic experiences during military service and subsequent PTSD symptomology. A history of trauma should leave people vulnerable to PTSD if they experience additional trauma or stress. In line with this, we suggested that correlations between PTSD and trauma during the first 2 years of service would be significantly stronger among those persons who reported multiple premilitary traumatic events. Isolated traumas should not be as strongly correlated with changes in PTSD symptoms.

The word moderator is used here as defined by Baron and Kenney (1986). A moderator influences the strength or the direction of the correlation between a dependent variable and an independent predictor variable. In different categories or levels of the moderator, there is a significantly different relationship between the predictor and the dependent variable. A moderator acts only as an independent variable. It is not considered dependent on the predictor variable. If a moderational model is appropriate, then the interaction term between the moderator and the independent variable will significantly predict variability in the dependent variable even after accounting for their individual main effects.

To evaluate our moderational hypothesis, we first evaluated partial correlations (controlling baseline PTSD symptoms) between PTSD at final follow-up and total interpersonal trauma during the prior year. Table 16 shows these correlations separately for participants reporting multiple premilitary interpersonal trauma versus those reporting none or only one type of premilitary interpersonal trauma. Fisher's r-to-z transformation was used to test for significant differences in the strength of the correlations across groups (Howell, 1992). Overall the table

supports the mediational hypothesis, with all of the differences in the size of the correlations across groups in the hypothesized direction, and 3 out of 4 differences statistically significant.

Table 16

Partial Correlations Between Posttraumatic Stress Disorder (PTSD) Symptoms at 2-Year Follow-up and Interpersonal Trauma During Military Service, Controlling Baseline PTSD

		Premilitary Interpersonal Trauma	
PTSD Scale	*z*	Zero to One	Multiple
Reexperiencing	1.18	.24	.31
Avoidance	1.83*	.27	.38
Arousal	2.33**	.19	.33
Total symptoms	2.10*	.25	.37

Note. Missing data are excluded pairwise. Multiple interpersonal trauma, n = 343-354, Zero to one trauma, n = 788-809. Significance tests are one-tailed. *$p < .05$, **$p < .01$.

We further assessed the relationship between total interpersonal trauma and PTSD classification after 2 years of service using a logistic regression model. In the first block we entered baseline PTSD classification as a control variable. In block 2, we simultaneously entered 7 individual background characteristics. These were variables that have been correlated with PTSD symptoms among military personnel in past research including (a) gender, (b) age at service entry, (c) childhood family income level, (d) childhood family stability, (e) Armed Forces Qualification Test scores (AFQT), (f) baseline TSI dissociation scale scores, and (g) total premilitary interpersonal trauma. In block 3 we entered variables regarding risk and protective factors for PTSD during military service including (h) social support, (i) work stress, (j) job satisfaction, and (k) total interpersonal trauma in the year prior to final follow-up. These were again entered simultaneously. In a final block, we used stepwise regression to enter a series of interaction terms between the number of interpersonal traumas experienced in the year prior to

final follow-up and each of the other 11 independent variables entered in blocks 1 through 3. Participants with complete data for PTSD classification and for total interpersonal trauma at baseline and follow-up were included in this analysis (n = 1,175). Data missing from all other independent variables (0% - 4%) were replaced with their respective means.

Table 17 lists odds ratios for our results, or the estimated change in the likelihood of PTSD after 2 years given a 1-unit change in each dependent variable that contributed significantly in the analysis. Baseline PTSD classification contributed in block 1. In the final model, having been classified with PTSD at baseline was associated with approximately twice the estimated likelihood of PTSD classification after 2 years of service.

In block 2, total premilitary interpersonal trauma was significant, increasing the estimated likelihood of PTSD after 2 years of service by 1.17 times for each type of interpersonal trauma reported. Childhood interpersonal trauma was no longer significant in predicting 2-year PTSD classification after block 3 entered, suggesting that military experience variables mediate the relationship between childhood trauma and follow-up PTSD classification. Dissociation was the only additional significant predictor in block 2. In the final model, each unit change in dissociation increased the estimated likelihood of PTSD by 1.09 times. Since dissociation scores ranged from 0 to 27, comparing those with the lowest to highest scores the likelihood of PTSD increased 9.15 times. In block 3, interpersonal trauma within the year prior to follow-up, social support, and military job satisfaction all contributed significantly.

The hypothesis that childhood interpersonal trauma would mediate the relationship between trauma during military service and PTSD at follow-up was not supported in this analysis. Only the interaction with childhood family stability and trauma at follow-up entered the equation. This interaction should be interpreted cautiously, because it was unexpected, but Table

18 does show that the risk of PTSD given the experience of multiple traumas tended to decrease among participants reporting higher levels of childhood family stability. The difference was most pronounced comparing participants in the 1st (OR = 9.00) and third (OR = 0.95) quartiles.

Table 17

Logistic Regression of Posttraumatic Stress Disorder (PTSD) Classification at Final Follow-up: Odds Ratios for Significant Effects

Independent Variable	Block			
	1 (R^2 = .07[a])	2 (R^2 = .12 [a])	3 (R^2 = .24[a])	4 (R^2 = .25[a])
Premilitary Background Characteristics				
Baseline PTSD classification	4.33***	2.03**	2.05**	2.06**
Premilitary interpersonal trauma		1.17**	1.07	1.07
TSI dissociation scale		1.09***	1.09***	1.09***
Childhood family stability		1.00	1.01	1.04
Postmilitary Risk and Protective Factors				
Total interpersonal trauma			1.84***	4.94***
Social support			0.82***	0.82***
Job satisfaction			0.70***	0.70***
Interaction Terms				
Family stability by trauma				0.94*

Note. Only variables that contributed significantly in the equation are listed in the table. Final classification was 84% accurate overall, 23% among PTSD positive (n = 204), and 97% among PTSD negative (n = 971). [a]Nagelkirke's R^2 (Statistical Products and Service Solutions Inc., 1997). *p < .05. **p < .01. ***p < .001.

To further evaluate this interaction, we reproduced the partial correlations shown in Table 16 between 2-year PTSD scores and interpersonal trauma during the previous year. We again controlled baseline PTSD scores, but we computed correlations separately for participants with scores at or below the mean for childhood family stability and for those above the mean. Table

19 shows that there were significant differences in the size of the correlations for total PTSD and for the Anxious Arousal subscale. Correlations between trauma and PTSD were stronger for participants with a history of low childhood family stability.

Table 18

Percentages of Participants Classified with Posttraumatic Stress Disorder at 2-Year Follow-up by Childhood Family Stability Level and Interpersonal Trauma During the Previous Year

		Interpersonal Trauma	
Family Stability	*OR*	0 to 1 Trauma	Multiple Trauma
First quartile (*n* =286)	9.00	17%	64%
Second quartile (*n* = 312)	4.95	16%	48%
Third quartile (*n* = 283)	0.95	17%	17%
Fourth quartile (*n* = 280)	4.13	12%	35%

Note. OR = Odds Ratio. Only the ORs for the first and third quartiles were significantly different, $p < .05$.

Table 19

Partial Correlations Between PTSD Symptoms at 2-Year Follow-up and Interpersonal Trauma During Military Service, Controlling Baseline PTSD

		Childhood Family Stability	
PTSD Scale	*z*	At or Below Average	Above Average
Reexperiencing	1.48	.32	.23
Avoidance	1.10	.35	.29
Arousal	2.04*	.32	.20
Total symptoms	1.66*	.36	.27

Note. Missing data is excluded pairwise. Below average family stability, *n* = 485 - 500, Above average family stability, *n* = 617 - 631. Significance tests are one-tailed. *$p < .05$.

CONCLUSIONS

Beginning in basic training and continuing through 2 years of naval service, this study assessed trauma and stress occurring during military service and subsequent PTSD symptomology while controlling premilitary factors, such as childhood trauma, prior symptoms of PTSD, and other premilitary environmental factors. Our first objective was to document rates of PTSD symptomology among a representative group of Navy enlisted personnel over their first 2 years of service. Using the LASC to assess symptomology, we found that 39% of women and 29% of men could be classified with full or partial PTSD at baseline. Average symptom scores for recruits in this study were generally below those that have been reported in other studies using the LASC. Among participants who remained in the military and participated in the Recruit Survey at 2 years, the percentage of participants with either full or partial PTSD increased by 8% for women and by 9% for men. However, because there was somewhat disproportionate attrition from the service among personnel with high initial symptoms of PTSD, there was little change over time in PTSD symptomology among the total population.

Our second goal was to determine whether participants with histories of premilitary trauma had significantly greater PTSD symptomology than did those without such histories. We expected that participants with histories of premilitary trauma would report significantly greater PTSD symptomology than would those without such histories, and that multiple types of trauma would uniquely contribute in predicting long-term symptomology. In bivariate comparisons, we found significant relationships between PTSD and each of 20 different types of premilitary trauma. However, multivariate analysis suggested that primarily interpersonal trauma was uniquely related to PTSD. In particular, adult sexual assault, intimate partner violence, and parental verbal aggression in childhood were consistently predictive of PTSD for male and

female recruits. Furthermore, experiencing multiple types of interpersonal trauma did appear to have an additive effect on the likelihood of PTSD classification. Only 8% to 9% of those who reported no interpersonal trauma were categorized with PTSD, while 44% of men and 48% of women were identified with PTSD among those who reported 5 or more types.

The third focus of this study was the relationship of PTSD with military adjustment and job performance among participants as they transitioned into service life. We expected premilitary symptoms of PTSD and victimization histories to be predictive of poor adjustment performance. Symptoms of PTSD at baseline were correlated with lower military job satisfaction, increased healthcare use, disciplinary action, and attrition from military service.

Lastly, we explored whether experiences of premilitary victimization might moderate the relationship between trauma and PTSD symptomology after entering the service. We expected to find a stronger relationship between stress and trauma occurring during military service and the development of PTSD among participants reporting multiple premilitary traumatic experiences than among participants who reported no prior trauma or only isolated incidents. Preliminary analyses provided initial support for the hypothesis that premilitary trauma would moderate the relationship between PTSD and trauma during Navy service. However, in a final logistic regression there was only a moderational effect for childhood family stability on the relationship between PTSD and trauma during military service.

As part of this last analysis we assessed whether stressful environmental conditions in general might be important beyond the influence of specific acute trauma in the development of PTSD. From the perspective of a cumulative-life-stress model of PTSD, these experiences should all contribute in creating a vulnerability to PTSD. We did find that overall military job satisfaction uniquely contributed in estimating the likelihood of PTSD classification after 2 years

of service even after controlling baseline symptomology, premilitary trauma, and trauma during military service. Estimates of more objective military job stress did not contribute significantly.

Study Strengths and Limitations

This was the first longitudinal study to explore PTSD symptomology among a representative population of Navy enlisted personnel. This study was comprehensive and included both pre- and post-military PTSD symptoms and traumatic experiences. Although an important strength of this study was its prospective design, longitudinal research is always limited by study attrition. In this case, participants dropped out through attrition from naval service and through non-response at follow-up. Persons who attrited from military service were automatically eliminated from further follow-up. Although it is difficult to locate those who attrite from service, it would be helpful to track changes in PTSD among this sub-population.

Unlike a sizable portion of PTSD research, our sample came from a nonclinical, nonveteran population. The large sample size allowed us to determine PTSD symptomatology within a diverse sample of active-duty young adults. Participants came from a wide range of socioeconomic backgrounds. Thirty-nine percent were ethnic minorities and 47% were women. Still, the small age range in the sample, as well as the inclusion of only Navy recruits, may limit generalizability. Navy recruits may be different from other military recruits and young adults who are in the workforce or in college.

Like much large-sample research, the present study relied on self-report measures. Self-report data have been criticized for potential response bias. Social desirability factors may particularly influence responses to questions about sexuality, because participants may be uncomfortable providing information on the topic. Self-report studies rely on the willingness and ability of the participants to respond, and they use correlational rather than experimental designs.

Another limitation, common to self-report research regarding childhood experiences, is that participants must recall and report events that may have happened a long time ago. Recollections of traumatic events in childhood may be inaccurate due to reaction to trauma as well as normal processes of memory reconstruction and decay.

The measures used in our study present some limitations. Our measures of trauma and abuse were dichotomous, they relied on participants' personal ability to define and identify traumatic or abusive experiences, and they did not take the severity of specific traumatic experiences into account. For example, participants were asked to indicate whether they had ever been sexually assaulted, but were not given a definition of sexual assault, nor were they asked whether the assault involved sexual penetration or resulted in physical injury. We have previously reported that specific operational definitions of childhood abuse yield a combined rate for childhood physical, sexual, and verbal abuse that is twice that obtained using self-definitions (Olson, Stander, & Merrill, 2000; Stander et al., 2002). Operational definitions may be more sensitive in identifying individuals at risk for PTSD as a result of abuse. Additionally, although the 17-item version of the LASC contains the items that have been most strongly associated with PTSD, the full version may provide more precise documentation of symptoms.

Future Research Directions

The results of this study indicate several important directions for future research on the dynamics of PTSD within military populations. First, the Recruit Survey asked participants about an extensive list of possible traumatic events that might have contributed to symptoms of PTSD. However, the "other" trauma category still significantly contributed in estimating the likelihood of PTSD among both men and women. It would be helpful to continue exploring different types of trauma that might account for additional variability in symptomology.

Second, this study emphasizes the importance of considering factors that might make people more or less vulnerable to developing PTSD. One unexpected finding was that variability in PTSD outcomes is significantly greater among those who have experienced the most trauma, the group with the highest overall PTSD scores. This leads to the conclusion that the group with the most likelihood for poor outcomes is most difficult to predict. It is likely that there are number of risk and protective factors that influence the range of this variability. We did find some evidence that childhood family stability may be a protective factor moderating the strength of the relationship between serious trauma and the development of PTSD. The moderational effects of factors such as childhood family stability and interpersonal trauma history should continue to be the focus of research.

Finally, in past research sexual trauma has been particularly important for female veterans in influencing the development of PTSD (Fontana & Rosenheck, 1998). For instance, Wolfe et al. (1998) noted that among women Gulf War veterans sexual harassment was more predictive of PTSD than was combat exposure. In this study, the relationship between physical sexual harassment during deployment and PTSD symptoms appeared dependent on prior exposure to sexual abuse and assault as well as on subsequent exposure to stressful life events. In multivariate analysis, we found that childhood sexual trauma was significantly correlated with PTSD for women, but not for men. However, in directly comparing the size of the correlations across gender, we found no significant differences, nor did we find significant differences between the size of the relationships for sexual trauma and PTSD versus nonsexual trauma and PTSD for women. The importance of sexual trauma in particular for women should continue to be a focus for future research.

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APPENDIX

Table A1

Percentage of Participants Above the Clinical Cutoff on the Trauma Symptom Inventory Subscales in Relation to Total Interpersonal Trauma History

	Number of Different Types of Interpersonal Trauma					
Subscale	None	One	Two	Three	Four	Five+
Anxious Arousal						
Women	3%	7%	8%	7%	14%	20%
Men	2%	6%	6%	6%	10%	19%
Depression						
Women	4%	6%	9%	11%	13%	16%
Men	5%	8%	10%	15%	17%	29%
Anger-Irritability						
Women	5%	9%	10%	14%	20%	24%
Men	5%	9%	12%	19%	23%	28%
Intrusive Experiences						
Women	5%	10%	16%	11%	26%	31%
Men	7%	10%	20%	23%	33%	41%
Defensive Avoidance						
Women	6%	13%	19%	17%	27%	37%
Men	8%	11%	16%	15%	24%	34%
Dissociation						
Women	9%	13%	21%	19%	31%	34%
Men	8%	13%	18%	23%	22%	40%
Sexual Concerns						
Women	5%	12%	14%	18%	27%	29%
Men	3%	4%	6%	6%	10%	16%
Dysfunctional Sexual Behavior						
Women	10%	19%	26%	26%	32%	37%
Men	11%	21%	31%	40%	43%	64%
Impaired Self Reference						
Women	6%	10%	14%	16%	17%	23%
Men	7%	13%	15%	18%	26%	39%
Tension Reduction Behavior						
Women	6%	14%	22%	21%	32%	32%
Men	7%	13%	22%	32%	29%	46%

Note. Women, n = 2,498 - 2,521, Men, n = 2,749 - 2,791. All relationships were significant, $p < .001$.

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Research suggests that individuals with histories of trauma and abuse are more likely to develop posttraumatic stress disorder (PTSD) in reaction to subsequent stress. However, most studies in this area have used retrospective survey designs. This study analyzed data from a longitudinal study of Navy recruits, with data available on participants' premilitary histories of trauma, abuse, and PTSD symptomology. It estimated base rates for the prevalence and incidence of PTSD among Navy personnel. This study further explored the relationship of PTSD symptomology to military job performance, and it assessed moderating effects on the relationship between stressful events during military service and subsequent PTSD symptomology over a 2-year period.

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